Catalogue of American Amphibians and Reptiles.

Tanner, W.W. and H.A. Dundee. 2000. *Lineatriton, L. lineolus.*

Lineatriton Tanner
Mexican Slender Salamander

Spelerpes Cope 1865:197. Type species, *S. lucifuga* Rafinesque (1832), by monotypy.

Opheobatrachus Gray 1868:298. Type species, *O. vermicularis*, by monotypy.

Oedipina Cope 1887:8. Type species, *O. uniformis*, by monotypy.

Lineatriton Tanner 1950:39. Type species, *L. lineola*, by monotypy. Genotype based on examination of three specimens in the Edward H. Taylor collection from Cuatlapan, Veracruz, México. The primary study was on specimen number 26583 and some myological data were obtained from specimens 26612 and 26593. These specimens apparently were sold to the Field Museum of Natural History and to the University of Illinois. The latter were later transferred to the Illinois Natural History Survey collection. INHS swapped some specimens but has no record of museums to which they went. A canvas of major collections has not brought to light the current catalog numbers.

• CONTENT. A single species, *Lineatriton lineolus,* is recognized. See **Species Account** and **Remarks**.

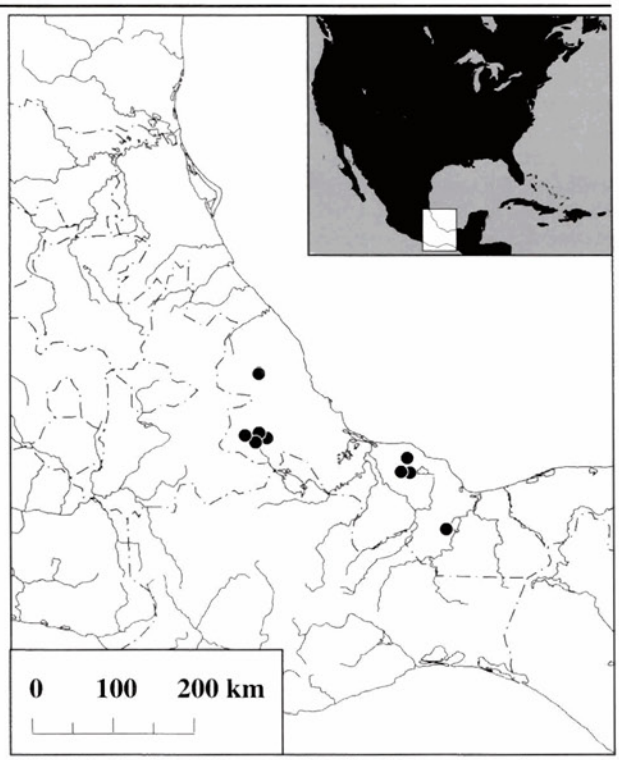
• DEFINITION. The only species of this genus is a greatly elongate, slender-bodied terrestrial salamander reaching at least 38 mm SVL and 128 mm TL. The tail is cylindrical, constricted at the base, and in adults is approximately twice as long as the combined length of head and body. Fourteen costal grooves are present. The arms and legs are short, the adpressed limbs are separated by nine costal folds. The hands and feet are partially webbed and the basal phalanges are grown together; the terminal and half of the adjoining phalanges of the two middle fingers and the three middle toes are free. The snout is short, blunt, and broadly rounded. The tongue is stalked and mushroom shaped; the sublingual fold is large and distinct.

The body has 15 elongate vertebrae; centra are twice as long as wide and a broad, bony alar expansion extends caudad from the transverse processes and is widest anteriorly, becoming narrower posteriorly. The alar expansion is absent on caudal and sacral vertebrae. Caudal and sacral vertebrae have a crest on the haemal arch; the crest is serrate in the anterior and smooth in the more posterior caudal vertebrae, and body vertebrae lack a dorsal crest.

The skull is well ossified and the frontal process of the premaxilla is single anteriorly and narrowly divided posteriorly. A single row of pleurodont teeth are on the maxilla and increase in size toward the premaxilla; premaxillary teeth are largest in males. The proximal ends of the ceratohyals are flattened and spatula-like, medially with two lobes, distally attenuate, hooked, and attached to the squamosal by a ligament. The second basibranchial is absent and the second ceratobranchial is larger than the first.

In the throat musculature the *M. intermandibularis anterior* is present, with no median raphe; *M. gularis* is large, approximately one third of its insertion at the midventral line; *M. quadrato-pectoralis* is present, large, and its origin is on posterior edge of squamosal and dorsal tip of quadrate. The *M. geniohyoideus medialis* is straplike, its origin is on the posterior surface of the mandible, and it is approximately as wide at the origin as it is at the insertion. The *M. geniohyoideus lateralis* is undivided and with a single origin. The *M. rectus cervicis* is in three unequal segments, the posterior segment as long as both anterior segments, middle segment shortest, and the insertion is on the second ceratobranchial.

The diploid chromosome number is 26.



MAP. Distribution of *Lineatriton lineolus.* Dots represent known collection sites. The type locality is too imprecise to plot.

• ILLUSTRATIONS, DESCRIPTION, DIAGNOSIS, DISTRIBUTION, FOSSIL RECORD, PERTINENT LITERATURE, LITERATURE CITED. See **Species Account**.

FIGURE 1. *Lineatriton lineolus* from Cuautlapan, Veracruz, México (photograph by Gabriela Parra-Olea).

FIGURE 2. *Lineatriton lineolus* from Barranca de San Miguel, Fortin de las Flores, Veracruz, México (photograph by Gabriela Parra-Olea).

• **ETYMOLOGY.** The generic name *Lineatriton* is derived from the Latin *linea* (feminine), meaning line (slender), and from the Greek *triton* (masculine), a sea god.

• **REMARKS.** Hilton (1946) did not refer directly to the species *lineola* in his description of the genus *Oedopinola*. By reading his (1946) report on *Oedopina* (*Oedopina*) *lineola*, we concluded that he associated *Spelerpes lineola* Cope with *Oedipina uniformis* Keferstein, and that the genus *Oedopinola* Hilton was established to include two Panamanian species *Oedipina complex* (Dunn) and *Oedipina parvipes* (Peters), and had no reference to *Spelerpes lineola*.

The genus *Opheobatrachus* Gray (1868) was erected to receive the species *Opheobatrachus vermicularis*, an elongate slender Costa Rica salamander. Cope (1869) recognized the genus *Opheobatrachus* and included the elongate salamanders in it, *Spelerpes lineolus* included. Recent accounts recognize *Opheobatrachus* as a synonym of *Oedipina* Keferstein (1868). For additional details, see Taylor (1952).

Wake (1966) assigned *Lineatriton* to the subfamily Plethodontinae, tribe Bolitoglossini, and supergenus *Bolitoglossa*.

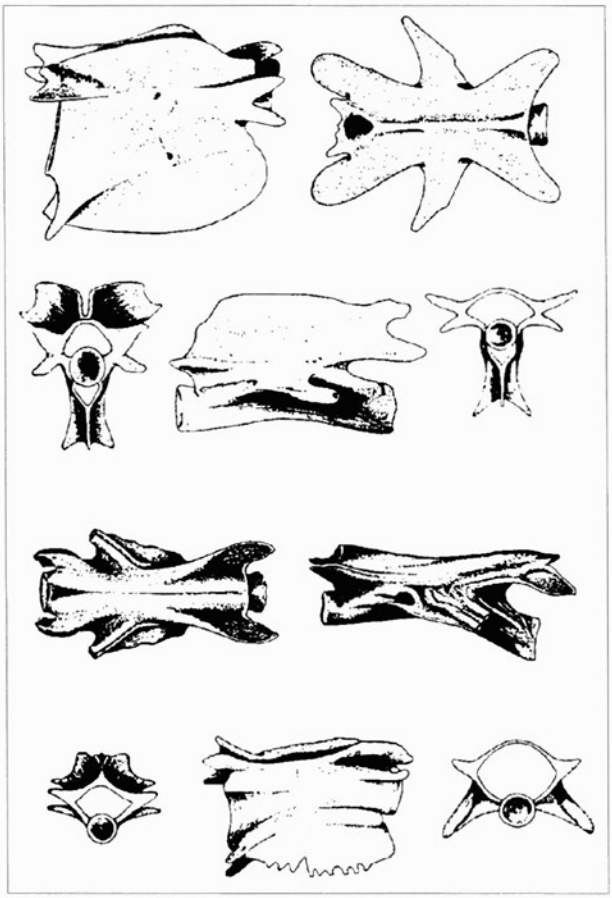


FIGURE 3. Illustrations of vertebrae to show the distinctive contrast between *Lineatriton* and representative bolitoglossine species: (1) lateral view of a caudal vertebra *Oedipina uniformis* Keferstein, (2) dorsal view of a trunk vertebra *Oedipina uniformis* Keferstein, (3) anterior end of a caudal vertebra *Oedipina uniformis* Keferstein, (4) lateral view of a trunk vertebra *Oedipina uniformis* Keferstein, (5) anterior end of a caudal vertebtra *Lineatriton lineolus* (Cope), (6) dorsal view of a trunk vertebra *Lineatriton lineolus* (Cope), (7) lateral view of a trunk vertebra *Lineatriton lineolus*, (8) anterior end of a trunk vertebra *Oedipina uniformis* Keferstein, (9) lateral view of a caudal vertebra *Lineatriton lineolus* (Cope), (10) anterior end of a trunk vertebra *Lineatriton lineolus* (Cope) (reprinted with permission from the Great Basin Naturalist 10:37–44).

Lineatriton lineolus (Cope)
Mexican Slender Salamander

Spelerpes lineolus Cope 1865:197. Type locality, "Table Land of Mexico," and in list of specimens sent by the collector, "Table Land of Mexico and Southern Mountains." Restated by Smith and Taylor (1948) as "Mexican Tableland." These probably refer to east-central Veracruz, below 1,250 m. Holotype, Academy of Natural Sciences Philadelphia (ANSP) 735, presumably collected by Charles Sartorius, who presented a variety of reptiles and amphibians, including *Lineatriton*, to the Academy of Natural Sciences (not examined by authors).
Opheobatrachus lineolus: Cope 1869.
Spelerpes (*Oedipus*) *infuscatus*?: Peters 1879:778. Type locality, "Haiti," in error. Holotype, Zool. Mus. Berlin (ZMB) 6556, age, sex, collector, and date of collection unknown (not examined by authors).
Geotriton lineolus: Garman 1884:39
Oedipina lineolus: Cope 1887:8.
Oedipina lineola: Cope 1896:1022.
Oedipus lineolus: Dunn 1924: 99.
Lineatriton lineola: Tanner 1950:39.
Opheoatrachus lineolus: Taylor 1938 (1939). *Ex errore*.
Lineatriton lineolus: Frost 1985:591. First use of current name.
Lineatriton lineolata: Obst et al. 1988. *Ex errore*.

• **DEFINITION**. The definition is the same as for the genus, but with the following additions: Cope indicated that "color is dull black, paler on the sides, lips and gular region minutely marbled with ashen." Dunn (1926) stated, "black above and below, legs, lips, and throat whitish" for a specimen from Jalapa, Veracruz. Shannon and Werler (1955), reporting on living specimens, said, 'some are uniform lead gray overcast, others somewhat lighter above, darkening on the sides. One specimen is uniformly light brown. A pencil-thin vertebral line of pigmentation may be present and may split to form a Y on each side of the occiput.' One specimen they examined was suffused dorsally with slightly elevated punctate greenish-yellow spots.

• **DIAGNOSIS.** *Lineatriton lineola* can be distinguished from any other wormlike salamanders by the reduced number of costal grooves (14), by the partially free middle digits, and by the very long and narrow vertebrae.

• **DESCRIPTIONS.** Descriptions were provided by Cope (1865), Dunn (1926), Günther (1902), Ramírez-Bautista (1977a, b), Tanner (1950), Taylor (1938 [1939], 1944), and Wake and Elias (1983).

• **ILLUSTRATIONS.** Tanner (1950) illustrated vertebrae and compared them with those of *Oedipina uniformis*. Tanner (1952) showed the myology of the hyobranchial apparatus. Taylor (1938 [1939]), Shannon and Werler (1955), Wake (1987), and Wake and Lynch (1976) included black and white photos of adults, the latter showing a specimen with punctate spots. Trufelli (1954) included a line drawing of the mental gland. Sever et al. (1990) presented a photo of a histological section of a female cloaca and of a line drawing reconstruction of that same cloaca. Sever (1994) included photos of histological sections of a male cloaca. Black and white photos of chromosomes appear in León and Kezer (1978).

• **DISTRIBUTION.** The species is found in central Veracruz, México. It has been found under stones, under leaf litter, in rotten logs, and under trash in coffee and banana plantations. The habitats are below the cloud forests, but certainly as high as

1250 m. Pelcastre-Villafuerte and Flores-Villela (1992) indicated that the habitat is perennial evergreen tropical forest that contains many epiphytes and canes and the highest precipitation in Veracruz.

• **FOSSIL RECORD.** None.

• **PERTINENT LITERATURE.** References are arranged by topic: **anatomical comparisons** (Taylor 1944), **anatomy** (Tanner 1950, 1952; Lombard 1977; Rabb 1955), **blood** (Villalobos et al. 1988), **checklists** (Brame 1967, Gorham 1974, Frost 1985), **cleared and stained specimen** (Rabb 1955), **body temperature** (Feder et al. 1982), **cloacal histology** (Sever 1990, Sever et al. 1994), **common names** (Liner 1994, Sokolov 1988), **comparisons with other genera and species** (Tanner 1950, 1952), **conservation** (Flores-Villela and Fernández 1988), **distribution** (Flores-Villela 1993; Pelcastre-Villafuente and Flores-Villela 1992; Ramírez-Bautista 1977a,b), **ecogeography** (Ramírez-Bautista and Nieto-Montes de Oca 1996), **eggs** (Sessions 1977), **embryos** (Sessions 1977), **habitat** (Pelcastre-Villafuerte and Flores-Villa 1992, Pérez-Higareda 1981, Ramírez-Bautista and Nieto-Montes de Oca 1996, Shannon and Werler 1955, Sessions 1977, Taylor 1938 [1939], Wake 1987, Wake et al. 1992), **keys** (Casas Andreu and McCoy 1979; Dunn 1924, 1926; Flores-Villela et al. 1987; Smith and Taylor 1948), **mental gland** (Trufelli 1954), **spermatheca** (Sever et al. 1990), and **tail autotomy** (Wake and Dressner 1967).

• **ETYMOLOGY.** The specific epithet is derived from the Latin *lineola* (feminine), meaning a line, likely in reference to the thin vertebral line that appears in some specimens.

• **REMARKS.** Considerable uncertainty existed in the literature (1865–1890) regarding the relationships of *Lineatriton lineolus* and other elongate Neotropical salamanders. Piatt (1935) recognized them to be distinct and suggested that they be removed from the genus *Oedipus*, where they had been placed by Dunn (1924), and returned to the genus *Oedipina*. Tanner (1950, 1952) conducted a comparative myological and osteological study of the throat, sternum, and vertebrae of the slender (wormlike) salamanders of México (*Oedipina* [*Spelerpes*] *lineola*) and representatives from Central America (Costa Rica and Panamá), *Oedipina uniformis* and *Oedipina parvipes*. He demonstrated that the Mexican species did not belong in the genus *Oedipina*, and he erected the genus *Lineatriton* to receive the species *Spelerpes lineola* Cope.

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